



Best Management Practices (BMPs) For Fluid Minerals – Part 2

REDUCING WILDLIFE HABITAT FRAGMENTATION

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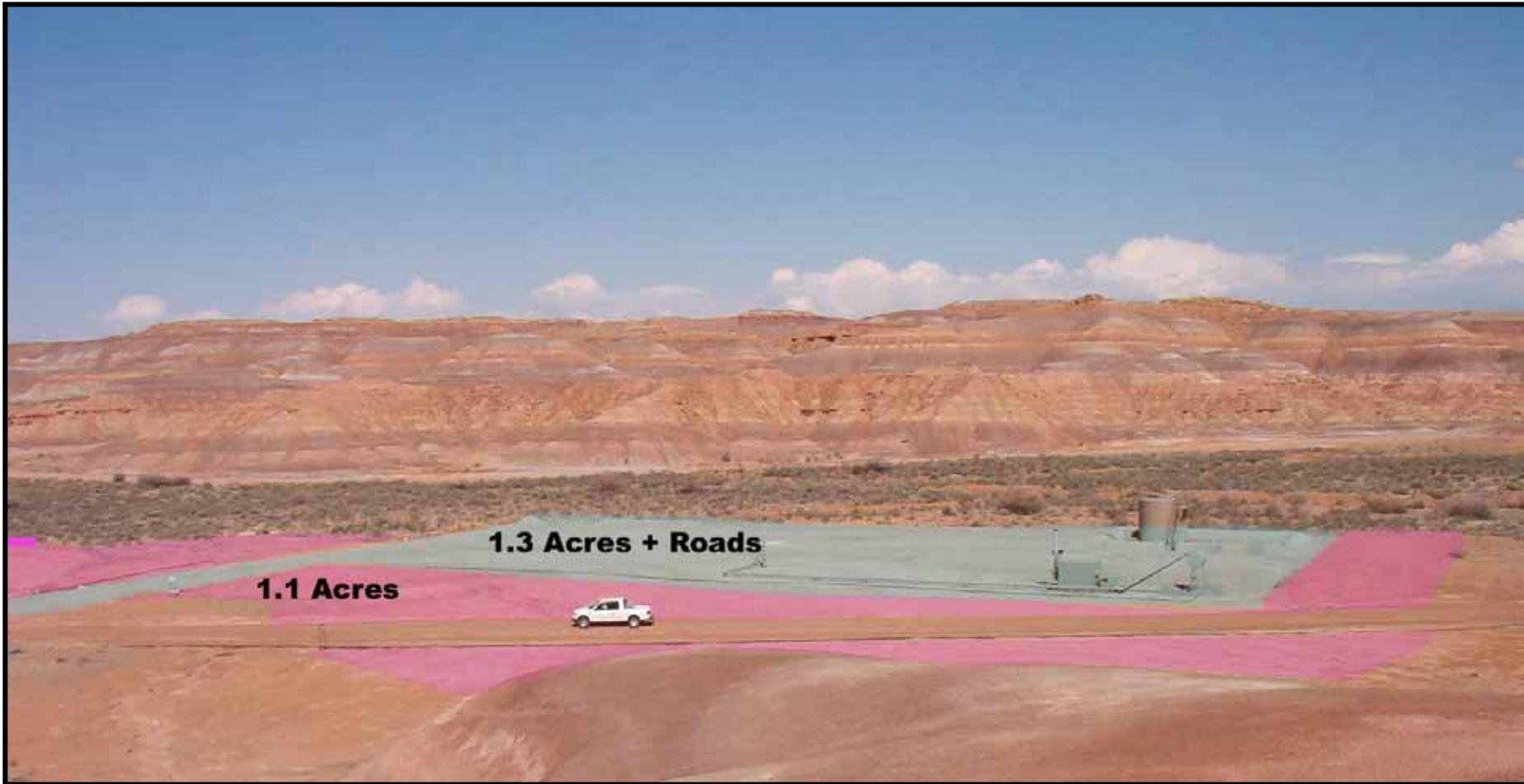
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Use BMPs to: Minimize Wildlife Habitat Fragmentation

Typical BMPs May Include:

- Minimizing Roads, Utilities, & Well Pads
- Drilling Multiple Wells from a Single Well Pad
- Eliminating Hazards to Wildlife
- Reducing Noise
- Remote Production Monitoring

Interim Reclamation



Why Stop at 1.3 Acres?

Reduce the producing well pad in size as much as possible.

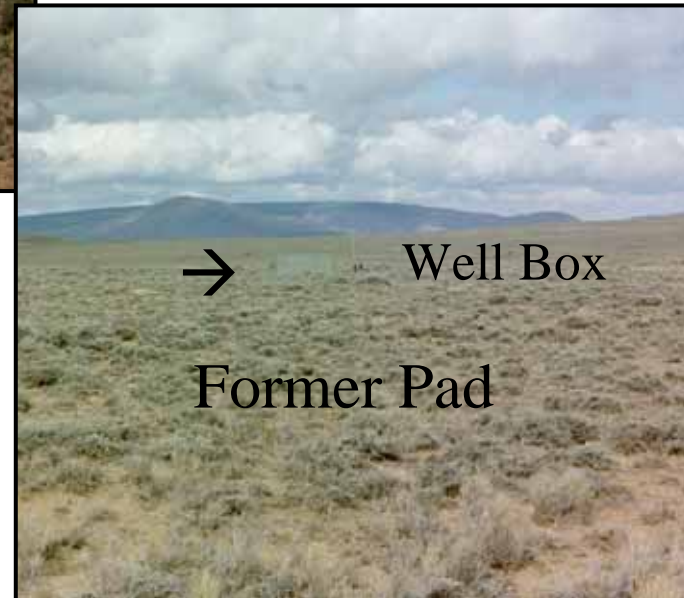
Extensive Interim Reclamation



Reduce the loss of habitat and forage during the life of the well.
(The workover rig can set up on the revegetated area.)

Steps:

- 1. Fully Recontour Unneeded Areas;**
- 2. Respread Topsoil Over Entire Pad;**
- 3. Revegetate to Reestablish Habitat**



Interim Reclamation

Good...

Vegetation Reestablishing
on Pad



Seeded and Growing



Unrevegetated Bare Ground

Not so Good...

Bare Ground.

Long-term

Loss of Habitat

And Forage

Minimize Roads



The Standard Road

**Reduce your loss of
vegetation and soil.**



New and Improved Road,
Now with Interim Reclamation!

Minimize Roads

BLM 9113 Manual - Bureau roads must be designed to an appropriate standard no higher than necessary to accommodate their intended functions...

In some cases,
2-track roads are suitable
and create the least
disturbance to habitat.

Consider:
Average Daily Traffic
load, soils, topography,
weather, season of use,
Safety, etc...



Drilling Multiple Wells On an Individual Well Pad

Drilling 10 Wells on 1 Well Pad....



- The feasibility of directional drilling is dependent on the subsurface geology and the depth of the hole.
- Directional drilling costs are typically greater.
- However, in the example shown on this slide, in steep country, directionally drilling 10 wells from one pad may cost the same or less than constructing and drilling at 10 separate well pad locations.



6 Wells

...instead of creating 10 Well Pads,
10 Roads, 10 Powerlines, etc...

Centralized Tank Batteries



Run flow lines to centralized tank batteries placed offsite.

- Result:** Greatly reduced truck traffic to individual wells.

Remote Monitoring

Remote Electronic Monitoring can reduce road and well traffic and resulting wildlife disturbance.



Utilities



Bury Power Lines in or
Adjacent to the Road.

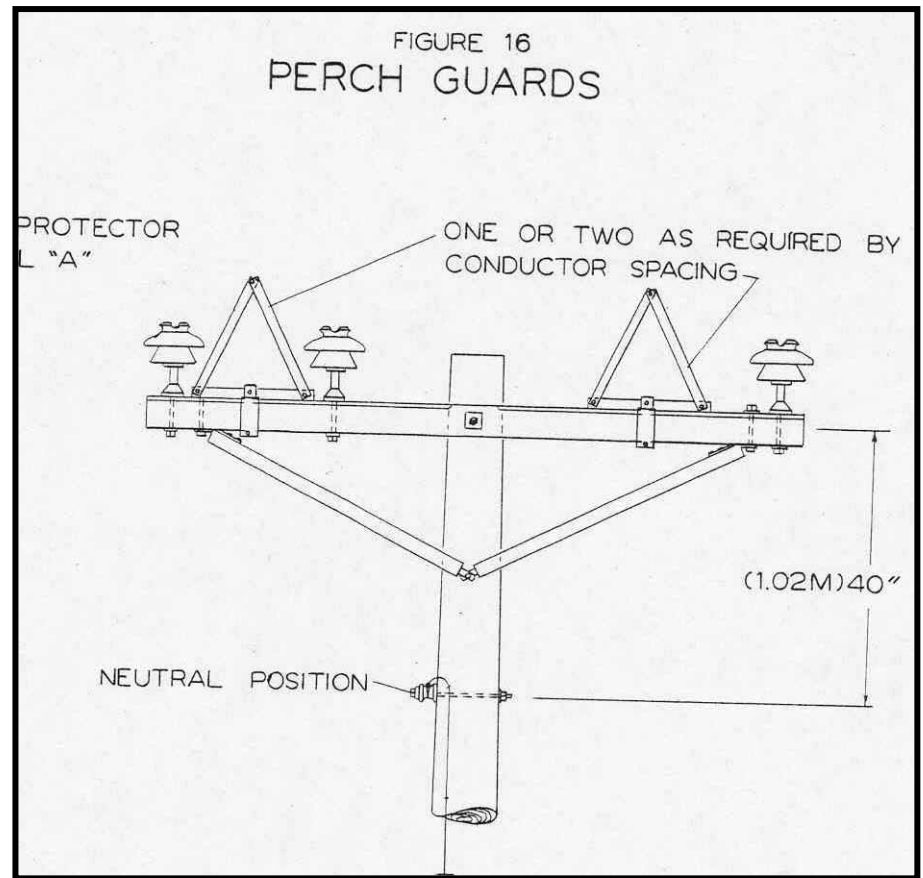
Cross-country
Vegetation Clearing
Fragments Habitat.



Utilities

In Important Sage-grouse Habitat and Prairie Dog Towns....

Modify New and Existing
Power Poles to Prevent Raptor
Perching



Or....Consider Burying Power

Minimize Noise

Noise can deter wildlife from using an area.

- Use mufflers.
- Consider using berms, walls, and/or distance to reduce sound.



Can you hear me now?

Planning

Planned Development can reduce unnecessary disturbance.



Bird Trap? This is Unacceptable.



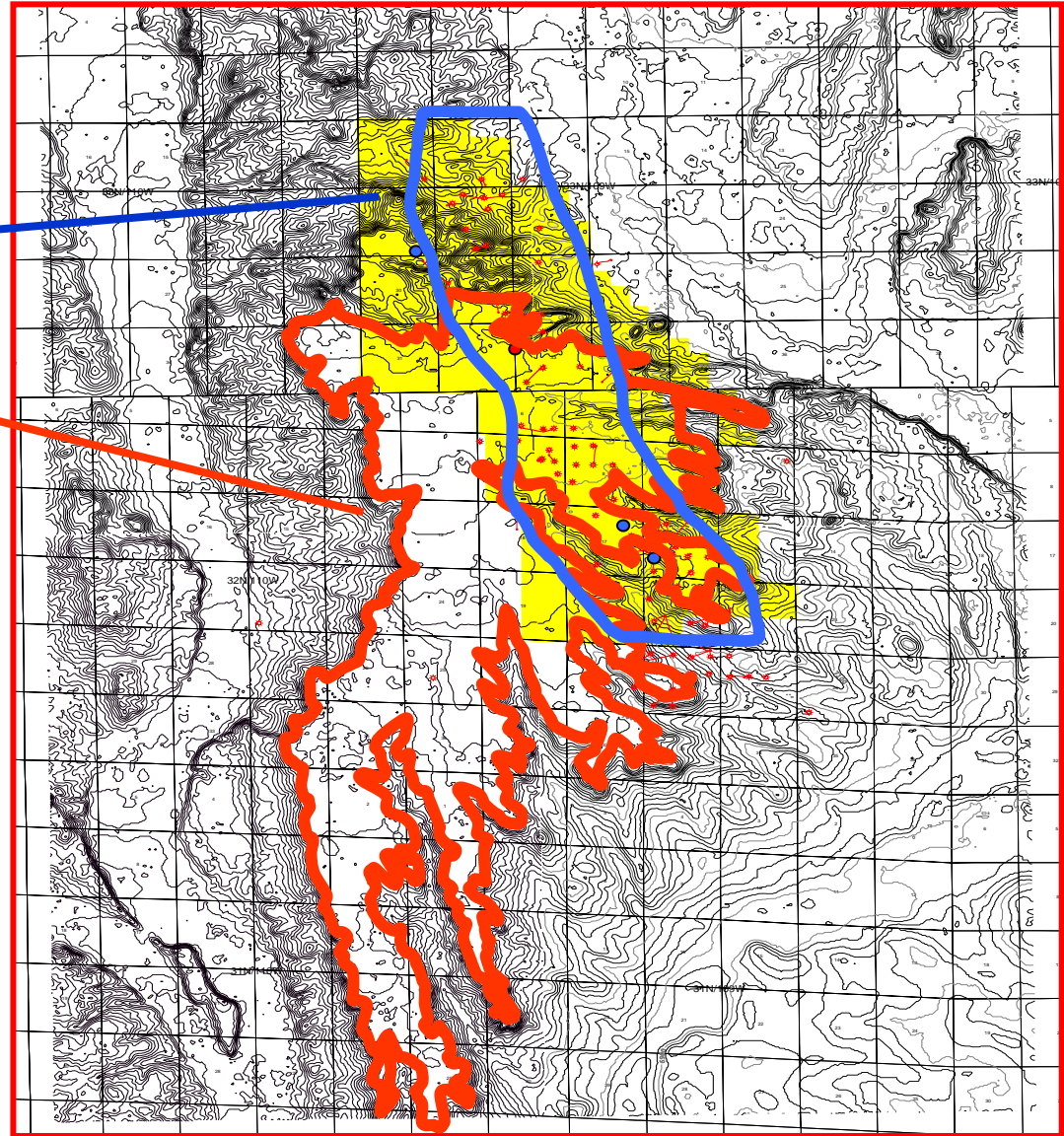
Oil in the Pit and Net is Down

Maintenance is Critical

Habitat Mitigation

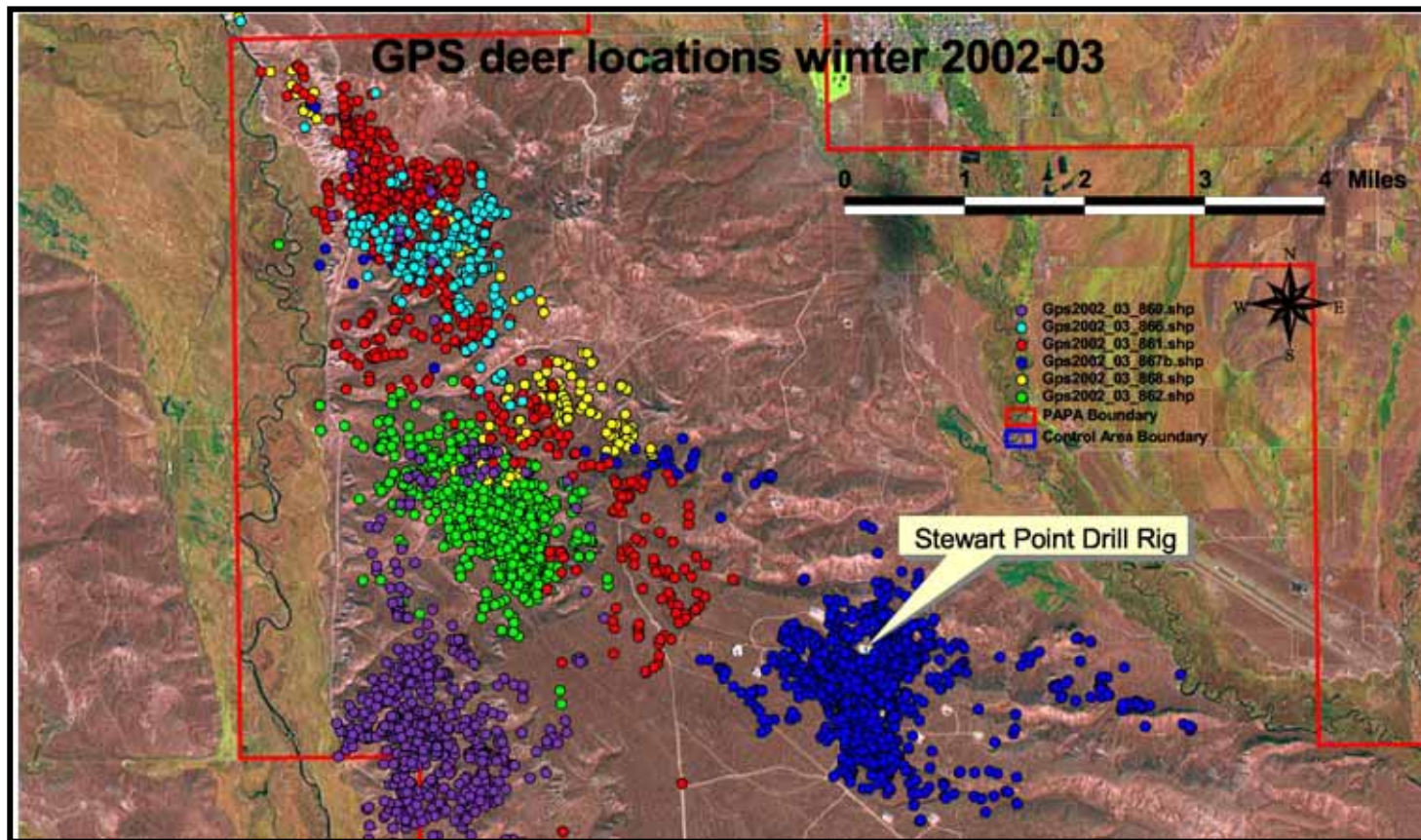
**Productive Energy
Area**

**Potential
habitat
mitigation area**



Wildlife Monitoring

Monitoring deer populations during drilling operations.



Each dot represents one deer in a small herd, 3 times per day.

Final Reclamation Monitoring

Ensure the site is recontoured, stable, and fully revegetated.
If done correctly, over time the habitat will restore itself.



In Summary:

Minimize the Footprint of Development

To reduce wildlife habitat fragmentation and degradation, consider lower standard roads, smaller pads, intermediate reclamation



Range Monitoring Point

